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Evaluation in the new Degrees: experiences in continual assessment.

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1. INTRODUCTION

With the aim to ensure comparability in the standards and quality of higher education qualifications in Europe, the European Higher Education Area (EHEA) was created [1]. With its implementation, a new concept of teaching has to be considered: the interactive teaching, in which the student must take an active part.

For about ten years, the University of Alicante has been developing a Teaching Research Program (TRP), known as Teaching Network [2], which objective is to improve the teaching quality and adapt its methodology to the EHEA. My particular experience with Teaching Networks began at 2006, and includes four different projects so far [3].

The work developed at the "Mathematics Degree first year network" (teaching guide for the subject "Chemistry"), and a comparison of the results obtained with students following the traditional lectures or the Bologna process are showed below.

2. TEACHING GUIDE

The fundamental points in the learning process (methodology and evaluation) are:

2.1. Learning objectives

- To learn the atomic structure basic principles, as well as the chemical elements classification, the different possible bonds in the chemical compounds and the various chemical reactions.
- To find the relationships between the bond theories and the chemical compounds structure, properties and reactions.
- To solve Chemistry problems, using mathematic methods (trying to show the students the interrelation of mathematics and chemistry).
- To solve Chemistry problems, using informatics applications.

2.2. Subject contents

- Unit 1: "The Chemistry basis". In three lessons ("atomic structure", "periodic table of the elements" and "chemical bond") the student will learn the fundamental concepts in the chemistry field.
- Unit 2: "Reactions and energy". In three lessons ("introduction to the chemical thermodynamics", "kinetic and chemical equilibrium" and "chemical reactions: acid-base, oxidation-reduction and precipitation") the students will learn the different possible chemical reactions and the energy changes involved.

2.3. Methodology

Following the EHEA idea, it includes both face-to-face instruction (FFI) and self-learning time (SLT, in which the student implication is fundamental).

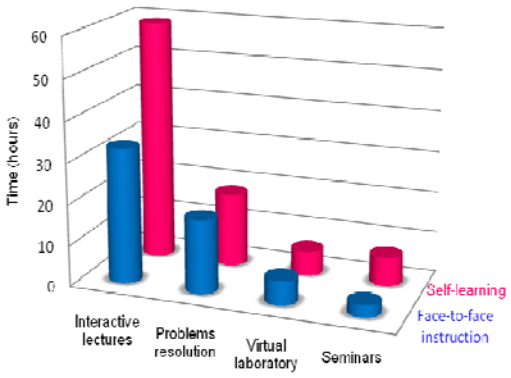

Fig. 1. Distribution of the FFI and SLT (hours) for the different activities developed.

Table 1. Learning times dedicated to every teaching activity and the methodology

Teaching activity	Methodology	FFI	SLT
Interactive lectures	Lectures supported by the use of blackboard, power point presentations, videos and connexions to suitable web links	33	59
Problems resolution	Resolution of chemistry problems, using the suitable informatics supports.	18	18
Virtual laboratory	Experimental approach to chemistry, showing the reactivity of the chemical elements and compounds, as well as the basis of a chemistry laboratory.	6	6
Seminars	Preparation and exposition of a monographic work and its power point presentation	3	7
Total time (hours)		**60**	**90**

2.4. Chronogram

Helps the student to understand the unit and lessons distribution and their correlation with the problems resolution times.

2.5. Evaluation

It is fundamental to use an evaluation system which allows the active participation of the student during the learning process [4, 5].

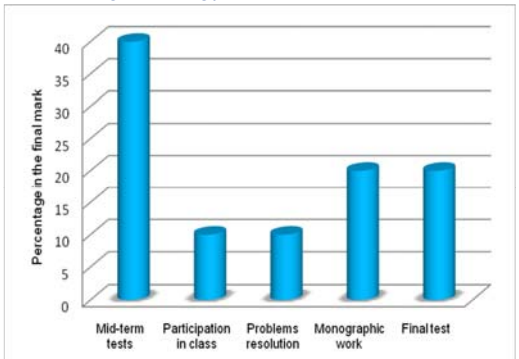

Fig. 2. Percentage in the final mark of the different evaluation tools used.

Table 2. Evaluation tools, their description and percentage in the final mark.

Evaluation tool		Description	Percentage in the final mark
Continual assessment	Periodic tests	Evaluation of the acquired knowledge after each two lessons (1-2 and 3-4) with two mid-term tests.	40%
	Teacher considerations	Participation in class, seminars and virtual laboratory	10%
	Exercises book	Resolution of chemistry problems	10%
	Preparation of monographic works	Preparation and exposition of a monographic work and its power point presentation	20%
Final test		Exam, with a maximum of 10 theoretical-practical problems.	20%

3. RESULTS OBTAINED.

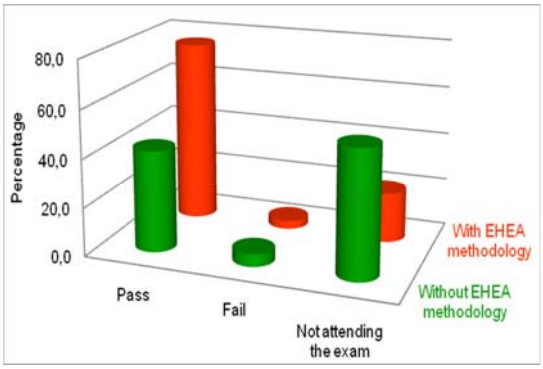

Fig. 3. Final mark % for either the students following or not the EHEA methodology.

4. CONCLUSIONS

The Teaching Guide, prepared working at the "Mathematics Degree first year network", has established a teaching and evaluation methodology which proves to be effective for a better understanding of the subject Chemistry, as shown by the comparison results above. Nevertheless, it can surely get better. For that reason, in a near future, different changes in the methodology will be made to try to improve the results obtained.

5. REFERENCES

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[3] Alcañiz-Monge, J.; Illán-Gómez, Mª J.; Román-Martínez, Mª C.; Sánchez-Adsuar, Mª S.; García-García, A. "Metodología y evaluación de las asignaturas del área de química inorgánica en el primer curso de los nuevos grados". VI Congreso Nacional de Innovación Docente en Química (INDOQUIM). 19 – 22 July 2011
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